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RE: Appeal Brief	APPLICATION SERIAL NUMBER: 10/687,336

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant:	John T. Kilcoyne; Ross Tsukashima; George M. Johnson; Christopher F. Klecher	Confirmation No.	7853
Serial No.:	10/687,336		
Filed:	October 16, 2003	Customer No.:	28863
Examiner:	Huong Q. Nguyen		
Group Art Unit:	3736		
Docket No.:	1065-012US05		
Title:	IMPLANTABLE MONITORING PROBE		

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By: Shirley A. Betlach
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Commissioner for Patents
Alexandria, VA 22313-1450

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PATENT

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APPEAL BRIEF

Mail Stop Appeal Brief - Patents
Commissioner for Patents
P.O. Box 1450,
Alexandria, VA 22313

Sir:

This is an Appeal Brief responsive to the Office Action mailed January 14, 2008, which finally rejected claims 50–58, and Advisory Action mailed April 11, 2008. The Notice of Appeal was filed on June 13, 2008. The period of response for filing this Appeal Brief therefore runs through August 13, 2008.

Please charge Deposit Account No. 50-1778 the amount of $510.00 for the submission of this Appeal Brief, as required by 37 C.F.R. §41.37(a)(2) for a large entity. Please charge any additional fees that may be required or credit any overpayment to Deposit Account No. 50-1778.

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REAL PARTY OF INTEREST

The Real Party of Interest is Medtronic, Inc. of Minneapolis, Minnesota.

RELATED APPEALS AND INTERFERENCES

There are no related appeals or interferences for the above-referenced patent application.

STATUS OF CLAIMS

Claims 50–58 are pending and are the subject of this appeal. Claims 50–58 are set forth in the attached Claims Appendix.

The Application as filed on October 16, 2003, included claims 1–54. Original claims 1–49 were canceled in a Preliminary Amendment dated October 16, 2003. Claims 55–57 were added in a Preliminary Amendment dated February 10, 2004. Claim 58 was added in an Amendment dated September 27, 2007.

Claims 50–55 and 58 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Schulman et al. (U.S. Patent No. 6,088,608, hereafter "Schulman") in view of Brune (U.S. Patent No. 5,984,875), and further in view of Ishikawa et al. (U.S. Patent No. 6,398,710, hereafter "Ishikawa") and Scarantino et al. (U.S. Patent No. 6,402,689, hereafter "Scarantino").

Claims 56 and 57 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Schulman in view of Brune, Ishikawa and Scarantino, and further in view of Kumar et al. (U.S. Patent No. 6,416,471, hereafter "Kumar").

STATUS OF AMENDMENTS

The claims on appeal are those submitted in the Amendment filed on September 27, 2007. No claims were amended in the Response to the Final Office Action mailed January 14, 2008, which Appellant filed on March 14, 2008.

SUMMARY OF CLAIMED SUBJECT MATTER

Independent claim 50 recites a system for measuring physiological parameters in the body of a patient indicative of gastroesophageal reflux. The system comprises a plurality of sensors[1] adapted to be implanted in the body of a patient. Each of the plurality of sensors periodically measures[2] a physiological parameter[3] indicative of gastroesophageal reflux. Each of the plurality of sensors also periodically transmits a signal indicative of the physiological parameter that is indicative of gastroesophageal reflux[4]. Each of the signals includes an identifier that is indicative of the sensor from which the signal is sent[5]. The system also comprises a receiver[6] that receives the signals from the plurality of sensors[7], determines a location for each sensor within an esophagus based on the identifier[8], and monitors the physiological parameter indicative of gastroesophageal reflux as a function of distance based on the signals and the locations[9].

GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

Appellant submits the following grounds of rejection to be reviewed on Appeal:

(1) The first ground of rejection to be reviewed on appeal is the rejection of claims 50–55 and 58 under 35 U.S.C. § 103(a) as being unpatentable over Schulman in view of Brune, and further in view of Ishikawa and Scarantino.

(2) The second ground of rejection to be reviewed on appeal is the rejection of claims 56 and 57 under 35 U.S.C. § 103(a) as being unpatentable over Schulman in view of Brune, Ishikawa and Scarantino, and further in view of Kumar.

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[1] *See, e.g.*, Appellant's originally filed Application: FIGS. 1, 4–11, 13, 16–22E, ref. num. 18; and p. 8, ll. 23–28; p. 26, ll. 28 and 29.
[2] *See, e.g.*, Appellant's originally filed Application: p. 30, ll. 8–11 and p. 30, ll. 16–29.
[3] *See, e.g.*, Appellant's originally filed Application: p. 10, ll. 7–28.
[4] *See, e.g.*, Appellant's originally filed Application: p. 29, ll. 11–24; p. 30, ll. 10 and 11; p. 31, ll. 6–9.
[5] *See, e.g.*, Appellant's originally filed Application: p. 26, l. 32 to p. 27, l. 1; p. 28, ll. 13 and 14; p. 32, ll. 26–33.
[6] *See, e.g.*, Appellant's originally filed Application: FIG. 1, ref. num. 32; p. 8, l. 2
[7] *See, e.g.*, Appellant's originally filed Application, p. 8, ll. 30 and 31.
[8] *See, e.g.*, Appellant's originally filed Application, p. 27, ll. 9–13.
[9] *See, e.g.*, Appellant's originally filed Application, p. 26, ll. 30–32.

ARGUMENT

Appellant respectfully traverses the current rejections advanced by the Examiner in the Final Office Action, and requests reversal by the Board of Patent Appeals based on the arguments below. Appellant respectfully requests separate review of each set of claims argued under separate headings.

FIRST GROUND OF REJECTION UNDER APPEAL

The rejection of claims 50–55 and 58 under 35 U.S.C. § 103(a) as being unpatentable over Schulman in view of Brune, Ishikawa and Scarantino should be reversed.

Independent Claim 50

Independent claim 50 recites a system for measuring physiological parameters in the body of a patient indicative of gastroesophageal reflux. The system of claim 50 comprises a plurality of sensors adapted to be implanted in the body of a patient, wherein each of the plurality of sensors periodically measures a physiological parameter indicative of gastroesophageal reflux and wherein each of the plurality of sensors periodically transmits a signal indicative of the physiological parameter that is indicative of gastroesophageal reflux. Per claim 50, each of the signals includes an identifier that is indicative of the sensor from which the signal is sent.

The system of claim 50 further comprises a receiver that receives the signals from the plurality of sensors. The receiver according to claim 50 must determine a location for each sensor within an esophagus based on the identifier. The receiver according to claim 50 must also monitor the physiological parameter indicative of gastroesophageal reflux as a function of distance based on the signals and the locations.

In the Final Office Action, the Examiner relied on a combination of Schulman in view of Brune, Ishikawa and Scarantino in support of the rejection of claim 50. However, and for several reasons, the combination of the teachings of these four references proposed in by the Examiner fails to support a prima facie case of obviousness of Appellant's claim 50.

For example, the Examiner has failed to articulate any "reasoning with some rational underpinning"[10] why one of ordinary skill in the art at the time the invention was made would have combined the teachings of Schulman, Brune, Ishikawa and Scarantino in the manner

[10] *In re Kahn*, 441 F.3d 977, 988, 78 USPQ2d 1329, 1336 (Fed. Cir. 2006).

proposed in the Final Office Action to produce the invention of Appellant's claim 50. Indeed, the proposed modification of the Schulman system would result in a system which is unsatisfactory for its intended purpose, which is impermissible.[11] Additionally, the applied references fail to provide a teaching or suggestion of a receiver that determines a location for each sensor within an esophagus based on an identifier, as required by Appellant's claim 50. Furthermore, the applied references fail to teach or suggest monitoring a physiological parameter indicative of gastroesophageal reflux as a function of distance based on the signals and locations within an esophagus, as required by Appellant's claim 50.

In support of the rejection of claim 50, the Examiner characterized Schulman as disclosing a system for measuring physiological parameters in the body of a patient,[12] which system includes a plurality of sensors that periodically measure a physiological parameter indicative of gastroesophageal reflux, such as pH, and transmit a signal indicative of the physiological parameter that is indicative of gastroesophageal reflux, and a receiver that receives and records the signals.[13] The Examiner acknowledged that Schulman does not disclose that each signal transmitted by the plurality of sensors includes an identifier that is indicative of the sensor from which the signal is sent, and characterized Brune as teaching a measuring system in which the sensors transmit a signal including an identifier code that is indicative of the sensor from which the signal is sent.[14] The Examiner concluded it would have been obvious to include the identifier code taught by Brune in the signals of Schulman to differentiate the particular sensor from which each signal was sent.[15]

The Examiner also conceded that Schulman in view of Brune does not disclose that the receiver determines a location for each sensor within an esophagus based on the identifier and monitors the physiological parameter indicative of gastroesophageal reflux as a function of distance based on the signals and location.[16] The Examiner cited Ishikawa and Scarantino in an attempt to overcome these deficiencies of Schulman in view of Brune. The Examiner characterized Ishikawa as teaching that the location of a plurality of implanted sensors is determined based on an identifier to allow proper determination of a desired process based on the

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[11] *In re Gordon*, 733 F.2d 900, 221 USPQ 1125 (Fed. Cir. 1984).
[12] Final Office Action dated January 14, 2008, p. 2, ll. 23–24.
[13] *Id.* at p. 3, ll. 1–7.
[14] *Id.* at p. 3, ll. 8–12.
[15] *Id.* at p. 3, ll. 12–15.
[16] *Id.* at p. 3, ll. 16–19.

known location,[17] and characterized Scarantino as teaching a plurality of implanted sensors positioned at different locations to gain more regional specific information regarding the site of placement, such as when measuring pH for gastrointestinal applications.[18] The Examiner reasoned that it would have been obvious to modify the system of Schulman in view of Brune with the teachings of Scarantino and Ishikawa to enhance the invention by taking into account the effect of location/distance of the sensor for the measurement of the physiological parameter indicative of gastroesophageal reflux and thus provide a more specific determination of such.[19]

Appellant respectfully disagrees with this reasoning; the proposed combination would not have been obvious to one of ordinary skill in the art at the time of the invention.

Schulman is generally directed to an electronic sensor that periodically performs integrity tests to verify the proper operation of the sensor.[20] One integrity test may include comparing the output of multiple sensors located in the same general tissue area.[21] The sensors may be assumed to be working correctly if the measurement data agrees within a certain threshold value, such as, for example, 20%.[22] If one of the sensors disagrees with the other sensors by more then, for example, 20%, the data from this sensor may be ignored, or the sensor may be disabled.[23] The sensors may measure pH.[24]

Brune is generally directed to a system including a number of ingestible boluses, which may include pH sensors,[25] each of the boluses for monitoring one or more physiological parameters of an individual animal in a group or herd.[26] Each of the boluses transmits a unique identification code.[27] Based on the unique identification code, the data for a particular animal within the group or herd can be identified. Brune does not disclose locating the animal, or the bolus within the animal, based on the identifier.

Ishikawa is generally directed to a system including one or more transponders for detecting radiation in a patient during tumor treatment and transmitting such data by radio

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[17] Final Office Action dated January 14, 2008, p. 3, ll. 19–21.
[18] *Id.* at p. 3, l. 21, to p. 4, l. 2.
[19] *Id.* at p. 4, ll. 2–9.
[20] Schulman, Abstract.
[21] *Id.* at col. 5, ll. 58-63.
[22] *Id.* at col. 5, l. 66 to Col. 6, l. 3.
[23] *Id.* at col. 6, ll. 3-7.
[24] *Id.* at col. 4, l. 64.
[25] *Id.* at col. 5, ll. 23-27.
[26] Brune, col. 3, ll. 1-5.
[27] *Id.*

frequency signals to an external processor.[28] The transponder can be encoded with a unique identification code, and a position sensing system precisely locates each transponder using radio frequency transmission signals.[29] This allows precise measurement of radiation dosing in specific areas of the tumor and surrounding tissue.[30] The processor apparently determines the location of each transponder through triangulation of the RF signal output by a transponder using two RF receivers and a CPU antenna.[31] Ishikawa mentions pH only once, in reference to the fact that a coating, such as phosphosilicate glass, may be applied to a transponder to enable the transponder to withstand very low pH levels.[32] Ishikawa fails to describe measuring pH.

Scarantino is generally directed to a system for monitoring and evaluating the status of a tumor undergoing treatment.[33] Scarantino describes that the system may monitor tumor or organ physiological and biological parameters,[34] that a physiological parameter may include pH,[35] and that the sensors may be used in a gastrointestinal tract.[36]

The Final Office Action relies on these four references to support the rejection of Appellant's claim 50. It is unclear how or why a person having ordinary skill in the art would have combined references directed to sensor integrity tests (Schulman), monitoring a group of animals (Brune), radiation dosimetry (Ishikawa) and evaluating tumor treatment (Scarantino) to reproduce the invention of Appellant's claim 50, as asserted by the Examiner. The combination of so many references with unrelated teachings would have only been made with the benefit of hindsight and Appellant's disclosure. In addition, there are numerous reasons why a skilled person would not have been motivated to combine the references to produce the invention of Appellant's claim 50.

For example, if a proposed modification would render the prior art invention being modified unsatisfactory for its intended purpose, then there is no rational reason for one of ordinary skill in the art to have made the proposed modification.[37] As described above, Schulman is directed to comparing the output of multiple sensors located in the same general

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[28] Ishikawa, col. 4, ll. 26-31.
[29] *Id.* at col. 4, ll. 35-39.
[30] *Id.* at col. 4, ll. 40-42.
[31] *Id.* at col. 5, ll. 17-31.
[32] *Id.* at col. 8, ll. 8-14.
[33] Scarantino, Abstract.
[34] *Id.* at col. 8, ll. 55-63.
[35] *Id.*
[36] *Id.* at col. 8, ll. 63-66.
[37] *E.g., In re Gordon*, 733 F.2d 900, 221 USPQ 1125 (Fed. Cir. 1984).

tissue area to ensure proper operation of the sensors. Schulman does not describe using multiple sensors at different implant locations to measure a parameter at different locations. Instead, Schulman describes implanting multiple daisy-chained sensors in the same general tissue area, and comparing the output of these sensors to ensure proper operation of the sensors, e.g., to provide redundancy.[38]

In the system including multiple implanted sensors, the output from each sensor is compared to the outputs of the other sensors to determine if each sensor is working correctly. For example, if five sensors are implanted near each other and measure the same substance, then when the data for all five sensors matches within a threshold value (e.g., 20%), it is determined that all five sensors are working properly.[39] However, if one sensor is outputting data that differs from the data output by the other four sensors by more than the threshold value, it is determined that sensor is not functioning properly, and the sensor data may be ignored or the sensor disabled.[40]

Different values can be expected, in at least some cases, when monitoring a physiological parameter indicative of gastroesophageal reflux as a function of distance, as required by claim 50. If the sensors of Schulman sensed these different values, the result would be at least one, and possibly more, of the sensors being disabled. Clearly, the system of Schulman would have provided no rational reason for a skilled person to produce the invention of claim 50. Moreover, it is clear that modifying Schulman to monitor the physiological parameter indicative of gastroesophageal reflux as a function of distance would render Schulman unsatisfactory for its intended purpose, which would further discourage a person having ordinary skill in the art from making the proposed modification.

In the Advisory Action, the Examiner responded to Appellant's above remarks by asserting:

> There is no recitation [in Appellant's claim 50] of any required change in the parameter being measured. . . Furthermore, even if [Appellant] assumes that different values would be detected, there is no evidence whatsoever that such detected difference would exceed the threshold value . . . and result in the disabling of the sensors. In fact, it is highly expected that such supposed changes

[38] *See e.g.*, Schulman, FIG. 1.
[39] *Id.* at col. 5, l. 63 to col. 6, l. 3.
[40] *Id.* at col. 6, ll. 3–7.

> in pH would not exceed [the threshold value] considering the very delicate nature of pH balance within the body.[41]

Appellant respectfully disagrees. For example, stomach acid may range from a pH of about 1 to a pH of about 2, while the pH of saliva may be expected to be approximately neutral (about 6.81 at 37°C). This difference is certainly greater than about 20%, which is the threshold value disclosed by Schulman. A difference between the pH of stomach acid and the pH of saliva may be expected when measuring a physiological parameter indicative of gastroesophageal reflux disease as a function of distance in an esophagus, when one sensor is located proximate the lower esophageal sphincter and is exposed to refluxed stomach acid, and another sensor is located more distant from the lower esophageal sphincter and is not exposed to refluxed stomach acid.

Regardless of the expected difference in the sensed values of the physiological parameter indicative of gastroesophageal reflux, in providing the example of different values being expected in at least some cases when monitoring a physiological parameter indicative of gastroesophageal reflux disease, Appellant was not arguing that Appellant's claim 50 requires monitoring different values, or that Appellant's claim requires the values to be different by more than about 20%, or any other threshold value disclosed in Schulman. Instead, Appellant was intending to provide an example to elucidate why one of ordinary skill in the art would not have been motivated to modify the system of Schulman in the manner proposed by the Examiner.

Stated another way, it is clear that the multiple sensor integrity tests disclosed in Schulman require the basic assumption that the physiological parameter should have approximately the same value (e.g., within about 20%). Absent this basic assumption, ignoring data obtained from or disabling a sensor that provides a value outside of this threshold does not make sense.

Appellant's claim 50 requires a receiver that receives signals from a plurality of sensors and monitors a physiological parameter indicative of gastroesophageal reflux as a function of distance. Regardless of whether the signals from the plurality of sensors match within a threshold value or differ by more than a threshold amount, because the physiological parameter is monitored as a function of distance, the receiver monitors the output of each sensor.

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[41] Advisory Action dated April 11, 2008, p. 2, ll. 6–11.

It is because of this necessary tension between the disclosure of Schulman, which is directed to integrity checks and teaches that differences in sensor output for a plurality of sensors indicates a faulty sensor, and Appellant's claim 50, which requires monitoring the output of a plurality of sensors as a function of distance, that one of ordinary skill in the art would not have been motivated to modify the system of Schulman to produce the invention of Appellant's claim 50, regardless of the teachings of the other prior art references. Modification of the Schulman system to produce the invention of Appellant's claim 50 would render the Schulman system unsatisfactory for its intended purpose, which is impermissible.[42]

As another example, none of the references discloses or suggests a receiver that determines a location for each sensor within an esophagus based on the identifier. First, Ishikawa is the only reference that discloses determining a location of a sensor, and these sensors are implanted in a tumor or in tissue surrounding the tumor. There is no suggestion that the sensors may be located within an esophagus and, therefore, no suggestion of determining a location within an esophagus. None of applied references suggest locating multiple sensors within an esophagus.

Moreover, Ishikawa only uses the identification code to sequentially query the transponders. However, the location is determined based on triangulation using signals received at two RF receivers and a CPU antenna. This is in contrast to Appellant's requirement of determining a location for each sensor within an esophagus based on the identifier.

Additionally, none of the references teaches or suggests monitoring a physiological parameter indicative of gastroesophageal reflux as a function of distance based on the signals and locations within an esophagus. As described briefly above, Schulman, Brune and Scarantino do mention that pH may be monitored. However, none of the references even mentions gastroesophageal reflux, much less discloses that measuring pH, or any other physiological parameter indicative of gastroesophageal reflux, as a function of distance is practicable or even desirable.

In summary, the references cited in the rejection of claim 50 cannot be combined without rendering the sensors of Schulman unsuitable for their intended purpose, the references provide no teaching or suggestion of a receiver that determines a location for each sensor within an esophagus based on the identifier, and none of the references teaches or suggests monitoring a

[42] *In re Gordon*, 733 F.2d 900, 221 USPQ 1125 (Fed. Cir. 1984).

physiological parameter indicative of gastroesophageal reflux as a function of distance based on the signals and locations within an esophagus.

Claims 51–58 depend from claim 50 and are patentable over Schulman in view of Brune, and further in view of Ishikawa and Scarantino for at least the reasons presented above with respect to claim 50.

For these reasons, the Examiner has failed to establish a prima facie case for obviousness of Appellant's claims 50–58. Reversal of this rejection is respectfully requested.

Dependent Claim 58

Claim 58 depends from claim 50 and further requires that the receiver monitors a change in pH as a function of distance from a lower esophageal sphincter. As described above, the applied references fail to disclose or suggest monitoring a physiological parameter that is indicative of gastroesophageal reflux as a function of distance. Certainly, then, the references do not teach or suggest a receiver that monitors a change in pH as a function of distance form a lower esophageal sphincter. None of the applied references even mentions the lower esophageal sphincter, much less suggests positioning sensors relative to the lower esophageal sphincter and monitoring a change in pH as a function of distance from the lower esophageal sphincter.

Furthermore, as described above, the intended purpose of the Schulman reference is to provide integrity checks for sensors. Monitoring a change in pH as a function of distance would render the sensors of Schulman unsuitable for their intended purpose. That is, Schulman disregards any data that differs from data collected by other sensors by more than a threshold percentage (e.g., 20%). This implicitly assumes that the data should be within a certain range of data from the other sensors. However, in Appellant's claim 58, a receiver monitors a change in pH as a function of distance. That is, the receiver monitors how pH varies over a distance and, accordingly, there may be different values measured by at least some of the plurality of sensors. Thus, using the sensors described in Schulman would not enable monitoring a change in pH as a function of distance, as any data that differs from data collected by other sensors by more than a threshold amount would be disregarded. Conversely, modifying the sensors of Schulman to enable monitoring a change in pH as a function of distance would render the sensors unsuitable for providing integrity checks for the sensors by comparing the output of multiple sensors. Thus,

a person of ordinary skill in the art would have no motivation to modify Schulman to produce the invention of Appellant's claim 58 as proposed by the Final Office Action.

For these reasons, the Examiner has failed to establish a prima facie case for obviousness of Appellant's claim 58. Reversal of this rejection is requested.

SECOND GROUND OF REJECTION UNDER APPEAL

The rejection of claims 56 and 57 under 35 U.S.C. § 103(a) as being unpatentable over the Schulman in view of Brune, Ishikawa and Scarantino, and further in view of Kumar should be reversed.

Claims 56 and 57

Claims 56 and 57 depend from claim 50, and further require that the receiver is configured to be worn by the patient, and that the receiver includes circuitry to sense a position of the patient and the receiver periodically records the position of the patient, respectively.

Because claims 56 and 57 depend from claim 50, they are patentable over the cited references for at least the same reasons presented with respect to claim 50. Kumar fails to provide any disclosure sufficient to overcome the deficiencies of Schulman, Brune, Ishikawa and Scarantino with respect to independent claim 50. Kumar is generally directed to a sensor band worn by a patient that includes sensors for ECG, respiration, skin temperature and motion.[43] The Examiner failed to point to any teaching the Kumar regarding internal sensors or a receiver that receives signals from a plurality of sensors and monitors a physiological parameter indicative of gastroesophageal reflux as a function of distance, as required by Appellant's claim 50, and accordingly, Appellant's claims 56 and 57, which depend from and include all the limitations of Appellant's claim 50.

For these reasons, the Examiner has failed to establish a prima facie case for obviousness of Appellant's claims 56 and 57. Reversal of this rejection is requested.

[43] Kumar, Abstract.

CONCLUSION OF ARGUMENT

Appellant respectfully requests review of the rejections addressed above, and reversal of all pending rejections.

Appellant respectfully requests separate review by the Board for each of the grounds or rejection addressed above under separate headings.

Respectfully submitted,

Date: 8-13-08

By: _____

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APPENDIX A
THE CLAIMS ON APPEAL

Claim 50: A system for measuring physiological parameters in the body of a patient indicative of gastroesophageal reflux, the system comprising:

a plurality of sensors adapted to be implanted in the body of a patient, wherein each of the plurality of sensors periodically measures a physiological parameter indicative of gastroesophageal reflux and wherein each of the plurality of sensors periodically transmits a signal indicative of the physiological parameter that is indicative of gastroesophageal reflux and wherein each of the signals includes an identifier that is indicative of the sensor from which the signal is sent; and

a receiver that receives the signals from the plurality of sensors, determines a location for each sensor within an esophagus based on the identifier, and monitors the physiological parameter indicative of gastroesophageal reflux as a function of distance based on the signals and the locations.

Claim 51: The system of Claim 50, wherein each of the plurality of sensors includes a pH monitor and an RF transmitter.

Claim 52: The system of Claim 51, wherein each of the plurality of sensors also includes a microprocessor that periodically receives a signal from the pH monitor and induces the RF transmitter to periodically send an RF signal indicative of the pH measured by the pH monitor.

Claim 53: The system of Claim 52, wherein the microprocessor of each of the sensors periodically enables the pH monitor of the respective sensor during a first interval of each measurement cycle to obtain the pH signal and then disables the pH monitor during a second interval.

Claim 54: The system of Claim 53, wherein the microprocessor of each of the sensors enables the RF transmitter of the respective sensor during the second interval and disables the RF transmitter during periods of each cycle other than the second interval and disables the pH monitor of the respective sensor during periods of each cycle other than the first interval.

Claim 55: The system of Claim 50, wherein the identifier for each of the signals comprises at least one of a frequency or a code.

Claim 56: The system of Claim 50, wherein the receiver is configured to be worn by the patient.

Claim 57: The system of Claim 50, wherein the receiver includes circuitry to sense a position of the patient, and the receiver periodically records the position of the patient.

Claim 58: The system of Claim 50, wherein the receiver monitors a change in pH as a function of distance from a lower esophageal sphincter.

APPENDIX B
EVIDENCE

None.

APPENDIX C
RELATED PROCEEDINGS

None.